(B) Amendment to the Claims

1. (currently amended) A method of processing a group of spatially related seismic data traces **utilizing a digital computer**, comprising:

defining seismic data windows extending over selected portions of said group of spatially related seismic data traces;

generating a frequency spectrum of the seismic data within successively selected windows of said seismic data traces by applying a transform to said successively selected windows having poles on the unit z-circle, where z is the z-transform;

determining the frequency having the greatest amplitude within the frequency spectrum of the seismic data within said successively selected windows;

utilizing said determined frequencies having the greatest amplitude to generate a seismic display in which horizontal dimension represents distance and vertical dimension represents time, and

utilizing said seismic display to determine the presence of thin beds.

2. (previously amended) The method of claim 1 wherein the seismic display represents the frequency having the greatest amplitude within each said frequency spectrum.

3. (previously amended) The method of claim 2 wherein said spatially related seismic data traces comprise a three-dimensional volume of seismic data.

4. (previously amended) The method of claim 3 further comprising generating a substantially horizontal cross-section of said seismic data to represent either the presence or absence of thin beds in said horizontal cross-section.

5. (previously amended) The method of claim 1 further comprising determining the amplitude of the frequency having the greatest amplitude within each said frequency spectrum; and

wherein the seismic display represents said amplitudes.

6. (previously amended) The method of claim 5 wherein said spatially related seismic data traces comprise a three-dimensional volume of seismic data.

7. (previously amended) The method of claim 5 further comprising generating a substantially horizontal cross-section of said seismic data to represent either the presence

or absence of thin beds in said horizontal cross-section.

8. (previously amended) The method of claim 1 further comprising:

determining for each generated frequency spectrum whether the peakedness of said generated frequency spectrum exceeds a selected value of peakedness; and

for each generated frequency spectrum for which the peakedness exceeds said selected value of peakedness, utilizing the frequency having the greatest amplitude to calculate bed thickness; and

wherein the seismic display represents calculated bed thickness.

9. (original) The method of claim 8 wherein said peakedness is kurtosis.

10. (currently amended) The method of claim 1 further comprising:

calculating ~~the~~ kurtosis of each said frequency spectrum;

determining if the kurtosis of each said frequency spectrum exceeds a selected value of kurtosis; and

utilizing said frequency having the greatest amplitude within each said frequency spectra having a kurtosis value which exceeds said selected value of kurtosis to calculate bed thickness; and

wherein the seismic display represents calculated bed thickness.

11. (previously amended) The method of claim 10 wherein said spatially related seismic data traces comprise a three-dimensional volume of seismic data.

12. (currently amended) The method of claim 11 further comprising generating a substantially vertical cross-section of said seismic data to ~~to~~ represent either the presence or absence of thin beds in said vertical cross-section..

13. (currently amended) The method of claim 1 wherein said transform is ~~the~~ **a** maximum entropy transform.

14. (original) The method of claim 13 wherein said transform has from one to four poles on the unit z-circle.

15. (currently amended) A method of processing a group of spatially related seismic data traces **utilizing a digital computer**, comprising:

defining seismic data windows extending over selected portions of said group of spatially related seismic data traces;

generating a frequency spectrum of the seismic data within successively selected windows of said seismic data traces by applying a maximum entropy transform to said successively selected windows;

determining the frequency value of the frequency component having the greatest amplitude within each said frequency spectrum;

utilizing said determined frequency values to generate a seismic display in which the horizontal dimension represents distance and vertical dimension represents time, and

utilizing said seismic display to determine the presence of thin beds.

16. (amended) The method of claim 15 wherein said ~~spatially related seismic data traces comprise~~ **seismic display comprises** a substantially horizontal cross-section of a three-dimensional volume of seismic data.

17. (original) The method of claim 15 wherein said method is implemented on a digital computer and comprises the following steps:

inputting default operational parameter values;

inputting operational parameters for said group of spatially related seismic data traces;

obtaining data set parameters from a first trace of said group of spatially related seismic data traces;

obtaining a first selected window of data from a first selected seismic trace;

calculating coefficients for the maximum entropy transform;

utilizing said coefficients to calculate said frequency spectrum; and

determining the frequency value of the frequency component having the greatest amplitude within each said frequency spectrum.

18. (currently amended) A method of processing a group of spatially related seismic data traces **with a digital computer**, comprising:

defining seismic data windows extending over selected portions of said group of spatially related seismic data traces;

generating a frequency spectrum of the seismic data within successively selected windows of said seismic data traces by applying a maximum entropy transform to said successively selected windows;

determining the greatest amplitude of the frequency components within each said

frequency spectrum;

utilizing said amplitudes to generate a seismic display in which the horizontal dimension represents distance and the vertical dimension represents time, and

utilizing said seismic display to determine the presence of thin beds.

19. (previously amended) The method of claim 18 wherein said ~~spatially related seismic data traces comprise~~ **seismic display comprises** a substantially horizontal cross-section of a three-dimensional volume of seismic data.

20. (original) The method of claim 18 wherein said method is implemented on a digital computer and comprises the following steps:

inputting default operational parameter values;

inputting operational parameters for said group of spatially related seismic data traces;

obtaining data set parameters from a first trace of said group of spatially related seismic data traces;

obtaining a first selected window of data from a first selected seismic trace;

calculating coefficients for the maximum entropy transform;

utilizing said coefficients to calculate said frequency spectrum; and

determining the greatest amplitude of the frequency components within each said frequency spectrum.

21. (currently amended) A method of processing a group of spatially related seismic data traces **with a digital computer**, comprising:

defining seismic data windows extending over selected portions of said group of spatially related seismic data traces;

generating a frequency spectrum of the seismic data within successively selected windows of said seismic data traces by applying a maximum entropy transform to said successively selected windows;

determining the frequency component having the greatest amplitude within each said frequency spectrum;

calculating ~~the~~ kurtosis of each said frequency spectrum;

determining if the kurtosis of each said frequency spectrum exceeds a selected value of kurtosis; and

utilizing said frequency components having the greatest amplitude within said frequency spectra having a kurtosis value which exceeds said selected value of kurtosis to

calculate bed thickness; and utilizing the calculated bed thickness to generate a seismic display in which the horizontal dimension represents distance and the vertical dimension represents time, said seismic display representing either the presence or absence of thin beds.

22. (previously amended) The method of claim 21 wherein said ~~**spatially related seismic data traces comprise**~~ **seismic display comprises** a substantially vertical cross-section of a three-dimensional volume of seismic data.

23. (original) The method of claim 21 wherein said method is implemented on a digital computer and comprises the following steps:

inputting default operational parameter values;

inputting operational parameters for said group of spatially related seismic data traces;

obtaining data set parameters from a first trace of said group of spatially related seismic data traces;

obtaining a first selected window of data from a first selected seismic trace;

calculating coefficients for the maximum entropy transform;

utilizing said coefficients to calculate said frequency spectrum;

calculating the kurtosis of said spectrum; and

determining whether said calculated kurtosis exceeds a preselected kurtosis value.

24. (currently amended) A device adapted for use by a digital computer**, said device being selected from the group consisting of a magnetic tape, a magnetic disk and an optical disk,** wherein a plurality of computer instructions readable by said digital computer and defining the process of claim 1 and instructing said computer to perform said process are encoded **on said device**.

25. (cancelled)